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Fall Trumpeter Swan Survey of the High Plains Flock

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Introduction

The annual fall trumpeter swan survey is conducted to determine production and distribution for a portion of the Interior Population of trumpeter swans called the High Plains Flock, in accordance with the Interior Population and High Plains Flock trumpeter swan management plans (1997 and 2005, respectively). Each plan outlines population objectives (VI-2 and A-1) and management strategies for monitoring population status, which includes aerial surveys in South Dakota and Nebraska. These surveys are part of a trumpeter swan monitoring program that spans over two decades to track abundance trends in the flock and condition of the wetlands swans inhabit.

Methods

The survey was conducted from September 5th to September 7th, 2006. We assumed that movement of swans was limited within this time frame; thus, double counting of swans was deemed minimal or non-existent. An aerial cruise survey was completed using a Cessna 206 airplane, flying at elevations of 800 to 1000 ft AGL and at speeds of 120 knots. The weather conditions were favorable with clear skies, low winds of 5 to 10 mph on the ground, and temperatures around 80º F.

When a potential swan was sighted, the survey biologists verified whether it was a swan and, if so, classified its age and social status. Swans were categorized as (1) pairs with or without broods, (2) singles with or without broods, (3) cygnets, or (4) groups (white birds). Adult and subadult birds were recorded as white birds, and gray birds were classified as cygnets. The survey biologist also evaluated habitat conditions (i.e., availability of food resources and water) from the air.

The traditional survey route included much of northwest Nebraska, southwest South Dakota, and Wyoming (Fig. 1). This year Wyoming (Colony site) was excluded from the route because there have been no swans sighted there for 6 years, and the distance to the survey site increases the expense of the survey substantially. The area can be monitored from the ground, and if swans return to Colony, that portion of the route may be reinstated.

Results

During the 2006 survey biologists counted a record-high 427 swans in the High Plains Flock. This is an increase of 19% from the 2005 estimate (Fig. 2), and was primarily the result of a higher number of non-breeding pairs and groups of white birds (208 to 271 birds). However, the number of singles, breeding pairs, and cygnets remained relatively stable. The 2006 results are above the 17-year average for white birds (196 ± 17) and total birds (275 ± 19), but not cygnets (80 ± 5). The Flock continues to experience a positive growth rate of 4.5% annually from 1990 to 2006 (Fig. 3). The overall production of cygnets dropped this year and the index of production rate (i.e., cygnets/white birds)

was low (0.19) compared to the long-term average (0.45). The specific results for each category are listed in Table 1.

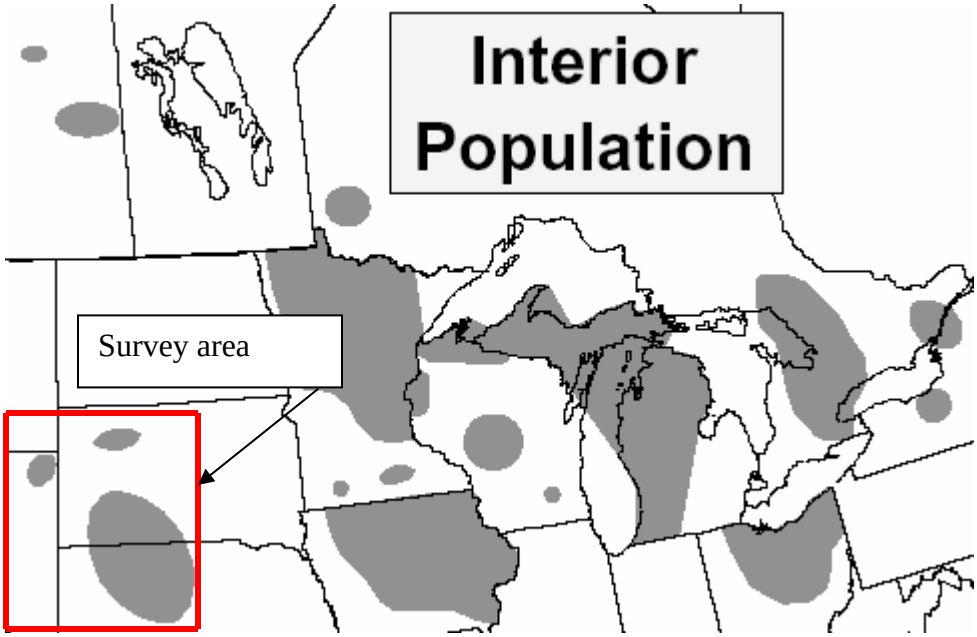
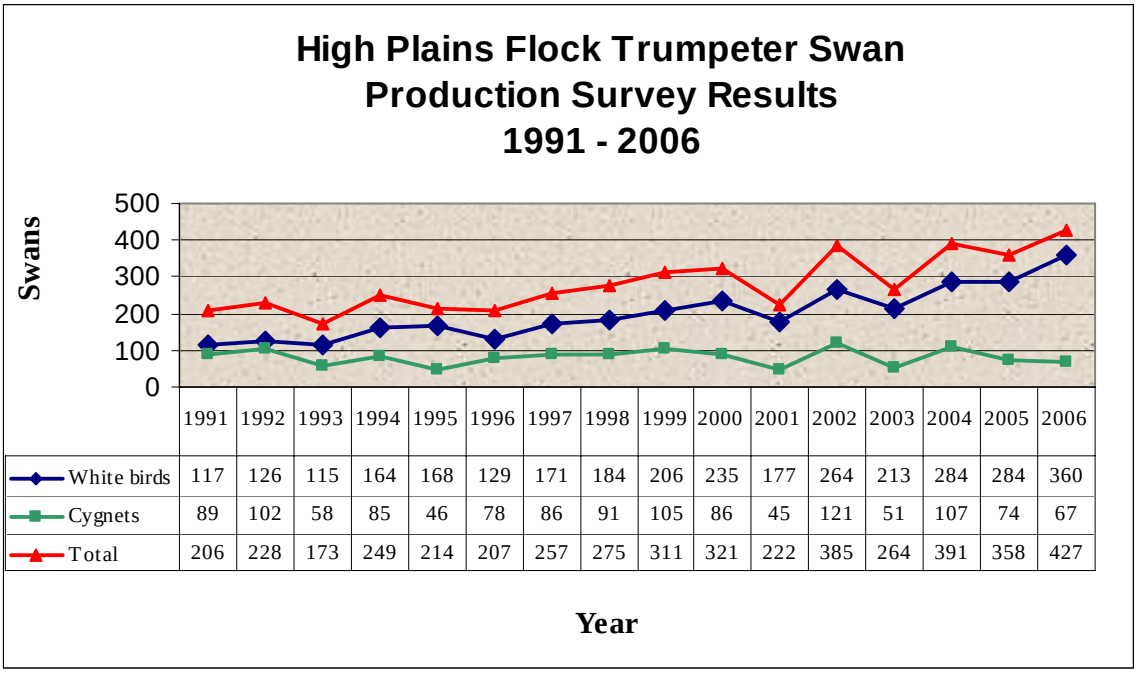


Figure 1. Survey area for High Plains Flock trumpeter swans located in southwest South Dakota and northwest Nebraska.



	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
White birds	117	126	115	164	168	129	171	184	206	235	177	264	213	284	284	360
Cygnets	89	102	58	85	46	78	86	91	105	86	45	121	51	107	74	67
Total	206	228	173	249	214	207	257	275	311	321	222	385	264	391	358	427

Figure 2. High Plains Flock Trumpeter Swan Production Survey Results 1991-2006.

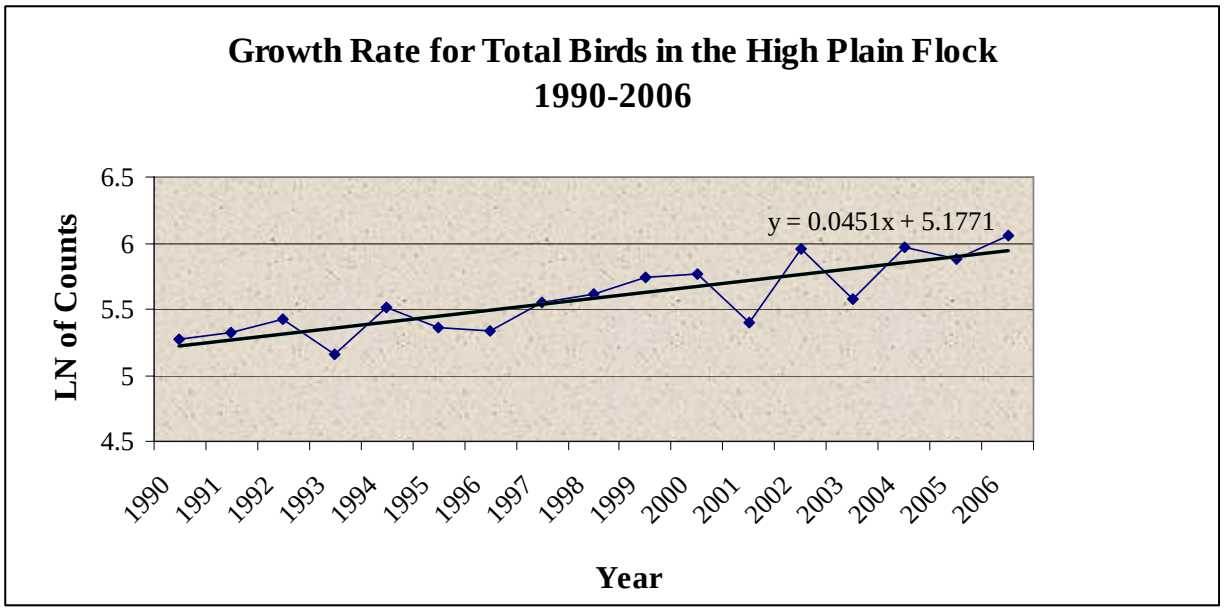


Figure 3. Growth rate of the HPF derived from the natural log of swans counted during fall production surveys from 1990 to 2006. The growth rate = 4.5% per year (R^2 = 0.71, P = 0.00).

Table 1. Results of the 2006 fall production survey of High Plains Flock trumpeter swans.

Population parameter	2005 Count	2006 Count
Adults and subadults	284	360
Cygnets	74	67
Total swans	358	427
Adults and subadults in groups	70	93
Total flocks	15	12
Pairs with cygnets	27	35
Pairs without cygnets	69	89
Singles with cygnets	2	1
Singles without cygnets	14	18
Total broods	29	20
Mean brood size	2.53	2.16

Discussion

Habitat Conditions

Most of the breeding pairs were located on high quality wetlands (i.e., marshes with good water quality and food resources) within 75 miles of Lacreek National Wildlife in the sandhills area. These wetlands are springfed and many still contained adequate water and food resources when the swans initiated nesting. However, many wetlands were dry, especially in the western and northern portions of the survey area. Precipitation in the survey area was well below historic values this year, resulting in moderate to severe drought conditions (Fig. 4). Precipitation was steady early in the spring, but declined

dramatically over the summer. Conditions continued to be favorable in the central and southeastern portions of the route, and swans have been expanding their range eastward according to Nebraska Game and Parks Commission personnel. This year the route was extended farther east into the sandhills and biologists were able to count additional birds (24) in those areas. Habitat conditions outside the sandhills were of poorer quality relative to those of the sandhills, with many of the wetlands being dry.

Flock Status

The number of swans counted this year is the highest on record for the HPF and was attributed to an increase in nonbreeding white birds. A large percentage (72%) of the pairs observed had no cygnets, and there was an increase in group sizes of white birds. This may be because many of the white birds counted have not reached breeding age and did not produce young. In 2004 a record number of cygnets were counted, and these birds are now two years old and likely are not breeding yet. Also, many of the highest quality wetlands are occupied by breeding pairs that breed at these locations year after year. In drought conditions, other wetlands that could provide breeding habitat may be very low or dry, and thus habitat for newly formed pairs may have been limited this year. A drop in cygnet numbers similar to the one experienced this year has happened before, but the flock increased to pre-decline levels in one to two years. In 2001 the number of cygnets dropped to 45, but rebounded to 121 the following year. This slight decrease in production is likely part of population dynamics for this long-lived bird and currently does not warrant concern.

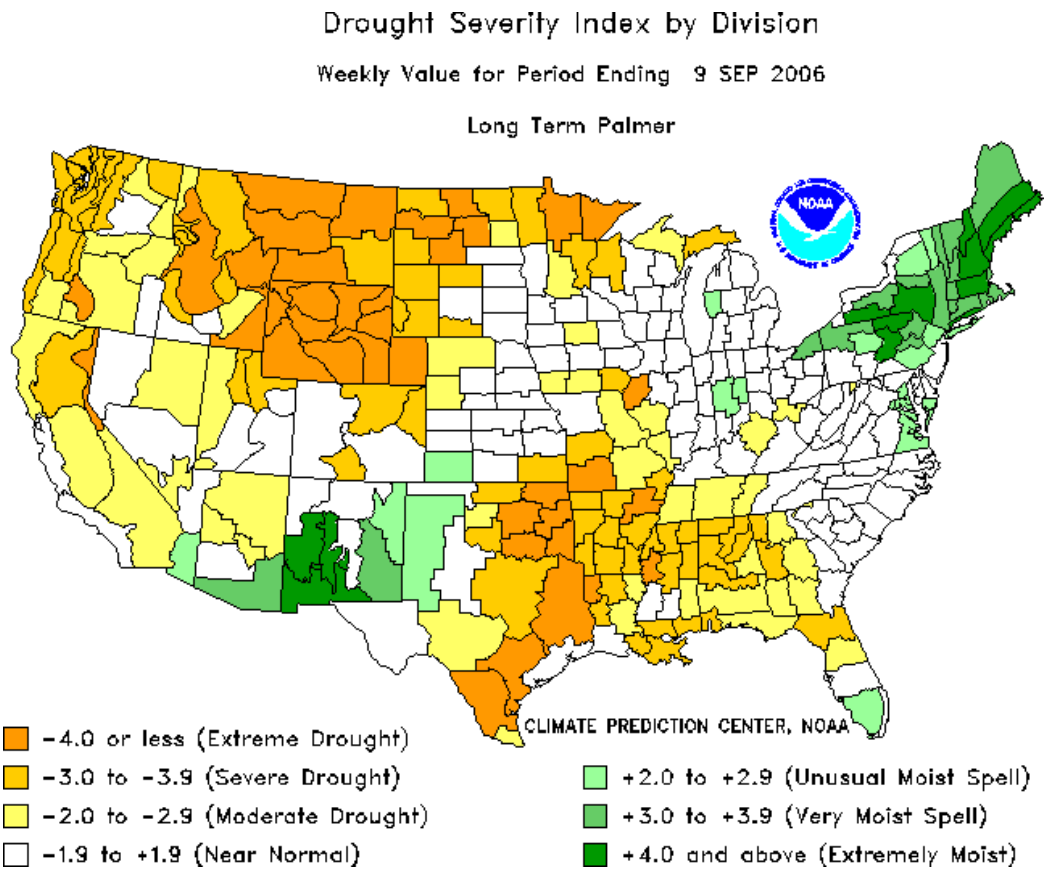


Figure 4. NOAA map of drought conditions just prior to the survey.

References

Comeau-Kingfisher, S., and T. Koerner. 2005. Management plan for the High Plains Trumpeter Swan Flock. U.S. Fish and Wildlife Service, Lacreek National Wildlife Refuge. Martin, SD. 19pp.

Subcommittee on the Interior Population of Trumpeter Swans. 1997. Mississippi and Central Flyway Management Plan for the interior population of trumpeter swans. Mississippi and Central Flyway Councils. [c/o/ USFWS, Migratory Coordinator] Twin Cities, MN. Unpubl. rept. 51pp.

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Appendix A. Survey results by location for the High Plains Flock, 2005. W.B. = White bird (adult/subadult), N.B.P.= non-breeding pair, and B.P. = breeding pair.

Date	State	W.B. Single	B.P.	Cygnets	N.B.P	W.B. Group	Comments
9/5/2006	SD	1					
	SD	1					
	SD					10	
	SD					4	
	NE		1	2			
	NE				1		
	NE				1		
	NE	1					
	NE		1		1		
	NE		1	2			
	NE		1	5			
	NE				1		
	NE				1		
Subtotal		**3**	**4**	**9**	**5**	**14**	**44**
9/6/2006	SD				1		
	SD				3	10	
	SD				1		
	NE		1	5			
	SD				2	8	
	SD		1	1			
	SD	1					
	NE				1		
	NE	1			1		
	NE		1	4		6	
	NE		1	3			
	NE		1	1			
	NE	1					
	NE		1	1	2	9	
	NE		2	3	2	3	
	NE	1					
	NE		1	1	1		
	NE		1	1			
	NE		1	6			
	NE				1		
	NE		1	1	1		
	NE		1	1			
	NE				3	4	
	NE					5	
	NE		1	1			
	NE		1	1	1		
	NE		1	4	2		

Appendix A. (cont.)

	NE				3		
	NE				1		
	NE	1					
	NE	1			2		
	NE		1	3			
	NE				1		
	NE				2	5	
	NE				1		
	NE	1			2		
	NE	1		1			
	NE				4		
	NE				2		
	NE				4		
	NE		1		2		
	NE				1		
	NE				1		
	NE					26	
	NE	1			2		
	NE				1		
	NE	1			1		
	NE	1			3		
	NE	1			1		
	NE		1				
	NE				1		
	NE				3		
	NE		1		6		
Subtotal		**12**	**20**	**38**	**66**	**76**	**298**
9/7/2006	SD					3	
	SD		1	1			
	NE	1			3		
	NE				1		
	NE		1	1			
	NE		1	2			
	NE	2					
	NE		1	1			
	NE				2		
	NE		1	3			
	NE		1	3			
	NE				4		
	NE		1	1			
	NE		1	4			
	NE		1	2			
	NE		1	1	4		

Appendix A. (cont.)

	NE	1			3		
	NE		1	1			
	NE				1		
Subtotal		**4**	**11**	**20**	**18**	**3**	**85**
Total		**19**	**35**	**67**	**89**	**93**	**427**